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Published in:
Journal of Personality

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2010

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Prinzle, P., van der Sluis, C. . M., de Haan, A. D., & Dekovic, M. (2010). The mediational role of parenting on the longitudinal relation between child personality and externalizing behavior. *Journal of Personality*, 78(4), 1301-1323.

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The Mediational Role of Parenting on the Longitudinal Relation Between Child Personality and Externalizing Behavior

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ABSTRACT Building on prior cross-sectional work, this longitudinal study evaluated the proposition that maternal and paternal overreactive and authoritative parenting mediates the effect of child personality characteristics on externalizing behavior. Data from the Flemish Study on Parenting, Personality, and Problem Behavior were used in a moderated mediation analysis ($N = 434$). Teachers rated children's Big Five characteristics, fathers and mothers rated their parenting, and 3 years later, children rated their externalizing behavior. Mediational analysis revealed both direct and indirect effects. Higher levels of Extraversion and lower levels of Benevolence were related directly to higher levels of child externalizing behavior. Higher levels of paternal authoritative parenting and lower levels of maternal overreactivity were related to lower scores on externalizing behavior. In addition, the relation between Benevolence, Emotional Stability, and externalizing behavior was partially mediated by parental overreactivity. Conscientiousness had an indirect effect on externalizing behavior through paternal authoritative parenting. Relations were not moderated by child gender. This study is of theoretical interest because the results demonstrate that parenting is a mediating mechanism that accounts for associations between personality and externalizing behavior.

Externalizing behavior begins early in life (Patterson, DeBaryshe, & Ramsey, 1989) and is quite stable (Prinzie, Onghena, & Hellinckx, 2006), with about half of the children continuing to have behavior problems beyond school years (Campbell, 1995). Children's externalizing behavior is a strong precursor of a variety of problems in

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Journal of Personality 78:4, August 2010

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DOI: 10.1111/j.1467-6494.2010.00651.x

adolescence and adulthood (e.g., criminality, alcoholism, and emotional problems; e.g., Caspi, Elder, & Bem, 1987). Connections between personality characteristics and externalizing behavior in children and adolescents have frequently been reported (Nigg, 2006; Tackett, 2006). However, despite the occurrence of significant relationships between personality and problem behavior, a thorough understanding of the processes that may explain these relationships is lacking. The majority of research to date has been purely correlational, seeking to identify relationships but not necessarily to understand and explain them (Tackett, 2006). Further, a lot of findings are based on a particular personality trait, rather than on multivariate approaches, hampering a more comprehensive picture of the relationships between personality characteristics and externalizing behavior. Finally, a majority of research focused on boys (e.g., Patterson, Reid, & Dishion, 1992) and is primarily based on mother ratings (e.g., Loeber, Green, Lahey, Frick, & McBurnett, 2000).

In the present study, we attempt to address these limitations. The overall aim is to elucidate processes that may explain the relation between personality and externalizing behavior using a longitudinal perspective. More specifically, we tested whether the effects of child personality on externalizing behavior, measured 3 years later, are (partially) mediated by different forms of parenting (overreactive and authoritative parenting). In addition, fathers as well as mothers rated their parenting behavior. Paternal parenting has been found to contribute uniquely, that is, in addition to maternal parenting, to the development of children and adolescents (e.g., Denham et al., 2000; Neiderhiser, Reiss, Lichtenstein, Spotts, & Ganiban, 2007; Verlaan & Schwartzman, 2002). Finally, our study included boys as well as girls, which offers the possibility to test whether the relations between personality, parenting, and externalizing behavior were moderated by child gender.

There is a growing consensus (Caspi & Shiner, 2006; Shiner & Caspi, 2003) that the broad spectrum of personality traits in children can be measured by the Five-Factor Model (FFM), also known as the Big Five (i.e., Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness). Researchers have examined several models linking personality and (mal)adjustment (for a review, see Shiner & Caspi, 2003; Tackett, 2006). The most investigated model, the *vulnerability* or *predisposition* model, hypothesizes that a child's personality affects the risk for the onset and maintenance of problem

behavior (Tackett, 2006), whereas environmental conditions such as parenting have only a limited role (Scaramella, Conger, Spoth, & Simons, 2002). Considerable evidence suggests that low Agreeableness, low Conscientiousness, and to a lesser extent high Neuroticism and Extraversion are related to externalizing behavior (De Pauw, Mervielde, & Van Leeuwen, 2009; Heaven, 1996; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Lynam et al., 2005; Prinzie et al., 2003).

Fewer studies have investigated the processes through which personality characteristics might put children at risk for different forms of externalizing problems. In the present study, we hypothesize that personality might predispose to externalizing behavior via mediating mechanisms. For example, personality may lead to changes in the environment, such as evoking different responses from parents. This type of evocative effect is illustrated by findings of Ge and colleagues (1996), who reported that early characteristics of adolescents at genetic risk for conduct disorder lead to differential reactions from caregivers, which, in turn, contribute to negative parenting that placed them at further risk for antisocial behavior. Also, Manders, Scholte, Janssens, and De Bruyn (2006) demonstrated a mediating role for the quality of the parent-adolescent relation in the association between Agreeableness, Conscientiousness, and Emotional Stability and externalizing behavior. Irritable and dominant adolescents may have difficulty regulating their own emotions and behaviors. This may, in turn, lead to more coercive and overreactive interactions with others. Agreeable, good-humored, and cheerful adolescents, on the other hand, may also be better able to obey their parents, which may result in a positive, favorable rearing climate (Prinzie et al., 2003).

In a previous study, we examined the moderating effects of children's personality on relations between negative parenting and externalizing behavior using cross-sectional data (Prinzie et al., 2003). Multiple regression analyses revealed that in the mother data as well as in the father data, dysfunctional parenting and the children's personality characteristics Benevolence (similar to Agreeableness or low Antagonism in adult personality models), Conscientiousness, and Extraversion were directly related to outcomes consistent with an additive model of their effects. Significant interactions indicated that children with low scores on Benevolence who were exposed to overreactive discipline practices exhibited higher levels of externalizing behavior. Children characterized by low scores on Conscientiousness

who were exposed to coercive parenting behavior showed elevated levels of externalizing behavior.

This study extends our previous work in several ways. First, this study investigated the relation between personality and problem behavior from a longitudinal perspective during the transition to adolescence. The transition to adolescence is an important developmental period for both children and parents (Galambos & Costigan, 2003). Children transition to secondary school and face the developmental task of increasing autonomy. Parents must learn to relax some control and remain supportive. How children and parents handle these changes might be important for subsequent adolescent adjustment. Second, Prinzie and colleagues (2003) used parental ratings for child personality, parenting practices, and externalizing behavior. However, because of rater bias it is not possible to disentangle children's personalities and children's externalizing behavior from parental personality because parents may have the tendency to underestimate or overestimate certain scores consistently (Van der Valk, Van den Oord, Verhulst, & Boomsma, 2001). To avoid rater bias, in this study teachers rated child personality, parents rated their own parenting practices, and children rated their own externalizing behavior. Regarding self-reports of problem behavior, it has been shown that adolescents report more externalizing problem behavior about themselves than their parents or teachers do about them (Loeber & Farrington, 1998; Verhulst & Van der Ende, 1992; Youngstrom, Loeber, & Stouthamer-Loeber, 2000). Furthermore, Prinzie and colleagues (2003) concentrated only on negative parenting behavior, thereby neglecting the possible positive effects of more authoritative parenting (see, e.g., Pettit, Bates, & Dodge, 1997). In this study, both positive and negative parenting were included for a more comprehensive view of the possible mediating effects of parenting. This study used simultaneous mediation analyses while accounting for potential collinearity among the mediator variables (Preacher & Hayes, 2008). As far as we know, no longitudinal research on the relationship between the Big Five personality dimensions in children, positive and negative maternal and paternal parenting, and externalizing behavior has been undertaken.

Based on the reviewed research, we hypothesized that (a) especially Benevolence and Conscientiousness will be negatively related to externalizing behavior (De Pauw et al., 2009; Prinzie et al., 2003); and (b) the effect of child personality (especially Benevolence and

Conscientiousness) on externalizing behavior will be partially mediated by parenting practices. Finally, the moderating effect of child gender was explored. There are a number of reasons why relationships among personality, parenting, and externalizing behavior may differ depending on child gender. First, boys and girls may differ on overall levels of personality. A recent meta-analysis on gender differences in temperament revealed consistent gender differences favoring girls within the factor of effortful control (related to Conscientiousness; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). Several dimensions within surgency (related to Extraversion) showed small to moderate gender differences favoring boys. Second, parents may use different types of discipline with boys and girls. Butler and Shalit-Naggar (2008), for example, reported more reciprocity in mother-daughter than in mother-son interactions. These differences in levels of personality, parenting, and externalizing behaviors may translate into differences between boys and girls in the relations between different forms of parenting and externalizing behavior. A meta-analysis by Rothbaum and Weisz (1994) supports this notion by showing that correlations between parenting and child externalizing are stronger for boys than for girls in studies with preadolescents and involving mothers. Given inconsistencies in the literature, analyses with regard to the moderating role of child gender were exploratory.

METHOD

Participants

The sample for this study consisted of 434 children (209 boys and 225 girls). The children's ages ranged from 9 to 13 years old ($M = 10.83$ years, $SD = 1.07$). The percentages of mothers (M) and fathers (F) with various educational levels were elementary school (M: 0.9%; F: 3.0%), secondary education (M: 41.1%, F: 43.3%), nonuniversity higher education (M: 45.2%; F: 34.4%), and university (M: 12.8%; F: 19.2%). The index of socioeconomic status (SES) was based on the Index of Occupations (*Beroepenklapper*; Van Westerlaak, Kropman, & Collaris, 1975), a Dutch system that is closely linked to the International Standard Classification of Occupations (International Labor Organization, 1988). In cases of both parents working, the parent with the higher-status occupation was taken into account. Families represent the full range of socioeconomic status, with 30% in the lower class, 51% in the middle class, and 19% in the upper class. Nineteen percent of the mothers and 20% of the fathers

were not working outside the home. There were no significant differences between subjects having missing values at T2 in their personality scores and parenting at T1. For both mothers and fathers, missing values ($n = 60$) were missing completely at random. Little's MCAR test was nonsignificant for both mothers ($p < .29$) and fathers ($p < .34$). Therefore, to account for attrition and to maximize sample size, missing values were imputed with the Expected-Maximization (EM) algorithm (Schafer & Graham, 2002). Schafer (1997) recommended this procedure, which is an iterative EM algorithm. In the EM algorithm, missing values for each variable are estimated iteratively from all the other variables using the data for all individuals with observed values on that variable, and random variability is added as the missing data are predicted. In this way, data from all mothers and fathers for whom scores regarding their parenting were available at Time 1 and from children for whom teachers had rated personality could be included in the analyses.

Assessments

Child Personality

To measure child personality, teachers completed the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999), a lexically based Dutch instrument designed to measure individual differences among children. The HiPIC is an empirically derived questionnaire including 144 items grouped into five factors: Extraversion (e.g., "Bubbles with life"), Benevolence (e.g., "Defends the weak"), Conscientiousness (e.g., "Works with sustained attention"), Emotional Stability (e.g., "Is readily scared" (R)), and Imagination (e.g., "Asks many why questions"). The HiPIC dimensions of Extraversion, Conscientiousness, and Emotional Stability refer to content that is similar to the adult Big Five counterparts and hence received the same label. To distinguish the broader content of the second factor from the adult Agreeableness factor, this factor was labeled Benevolence. The items of this dimension are more evaluatively negative in nature, referring to characteristics of the "easy versus difficult child" as conceived in the temperament literature. The HiPIC Imagination factor comprises both intellect and Openness to Experience items, blending the two alternative labels for the fifth factor emerging from adult adjective-based lexical studies (Goldberg, 1993) and the questionnaire-oriented FFM approach (Costa & McCrae, 1992). The HiPIC was identified by Shiner and Caspi (2003) as one of the sound instruments to assess personality in children. Findings concerning structural replicability, validity, and temporal stability have recently been reported by De Fruyt and colleagues (2006), Mervielde and De Fruyt (2002), and Prinzle and Deković (2008). Teachers rated children's

behavior on a 5-point scale ranging from 1 (*almost not characteristic*) to 5 (*very characteristic*).

Authoritative Parenting

Mothers and fathers rated their authoritative parenting via the Parenting Practices Questionnaire (PPQ; Robinson, Mandleco, Olsen, & Hart, 1995). According to Locke and Prinz (2002), the PPQ has parental nurturance scales with adequate psychometric characteristics. The scale for authoritative parenting contains 27 items and measures the extent to which parents reason with their children and children participate democratically (e.g., “Helps child to understand the impact of behavior by encouraging child to talk about the consequences of (his)(her) own actions”). The behavior is rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). Ratings of mother and father authoritative parenting were moderately correlated ($r = .40, p < .001$).

Overreactive Parenting

Mothers and fathers completed the Parenting Scale (Arnold, O’Leary, Wolff, & Acker, 1993) using a 7-point Likert scale ranging from 1 to 7. Recently, Prinzie, Onghena, and Hellinckx (2007) reexamined the factor structure and found acceptable to good internal consistency and test-retest reliability. Overreactivity relates to parenting behaviors of irritability, anger, and frustration and is associated with an authoritarian style of discipline. The nine items of the *overreactivity* factor present discipline encounters (e.g., “When my child misbehaves . . .”) followed by two options that act as opposite anchor points for the 7-point Likert scale (e.g., “I speak to my child calmly” vs. “I raise my voice or yell”). A statistically significant but small correlation was found between ratings of mother and father overreactive parenting ($r = .24, p < .001$).

Externalizing Behavior

The Youth-Self Report (YSR) was used to measure children’s externalizing behavior (YSR; Achenbach, 1991; Verhulst, Van der Ende, & Koot, 1997). Children rated externalizing behavioral items on a 3-point scale ranging from 0 (*not true*) to 2 (*very true or often true*). The externalizing syndrome consists of the subscales Aggression (19 items; e.g., destroys things, temper tantrums, physically attacks people) and delinquency (11 items; e.g., lying or cheating, running away from home, stealing at home or outside).

Procedures

The data reported in this study are part of the ongoing Flemish Longitudinal Study on Parenting, Personality, and Development. In 1999, a proportionally stratified sample of 167 schools in Flanders (Belgium) was composed, on the basis of the distribution of schools across the five Flemish provinces. Parents and teachers were selected randomly (a detailed description of recruitment, informed consent procedures, and sample characteristics is found in Prinzie et al., 2003; Prinzie, Onghena, & Hellinckx, 2005).

In this study, for each child, a different teacher rated children's personalities at Time 1 (2004). In Belgian elementary schools, teachers teach only one class, so they know the children well enough to provide valid ratings. In addition, teachers are familiar with a broader range of children, and they have greater expertise regarding normative child development than parents (e.g., Saudino, Ronald, & Plomin, 2005). The questionnaires were sent during spring (April). This means that teachers had experiences with the children for a period of 8 months. Mothers and fathers rated their own authoritative and overreactive parenting practices at Time 1 (2004). Children rated their externalizing behavior 3 years later at Time 2 (2007). This was the first time that children were included as informants. This study is based on families from which teacher ratings on personality *and* mother or father ratings were available.

Statistical Analyses

First, descriptive statistics and intercorrelations between variables were examined. Next, we examined a mediated model in which children's personalities are posited to influence children's externalizing behavior both directly and indirectly through parenting within a structural equation modeling framework (i.e., path models with observed variables; see Figure 1) using the Mplus 5.2 software package (Muthén & Muthén, 2007). The chi-square statistic (χ^2), comparative fit index (CFI), root-mean-square of approximation (RMSEA), and the standardized root-mean-squared residual (SRMR) were used to evaluate the fit of the models. CFIs above .90 (Kline, 1998), RMSEAs less than .08 (Browne & Cudeck, 1993), and SRMRs less than .10 (Kline, 1998) indicate close fit for a model and were used as the criteria for evaluating model fit beyond the chi-square statistic, which is affected by sample size.

In assessing mediation, it is important to make a distinction between various effects and their corresponding weights. The total effect (weight c) of an independent variable (IV) on a dependent variable (DV) is composed of a direct effect (weight c') of the IV on the DV and an indirect effect (weight $a \times b$) of the IV on the DV through a proposed mediator (M). Weight a represents the effects of the IV on the M, whereas weight b is the

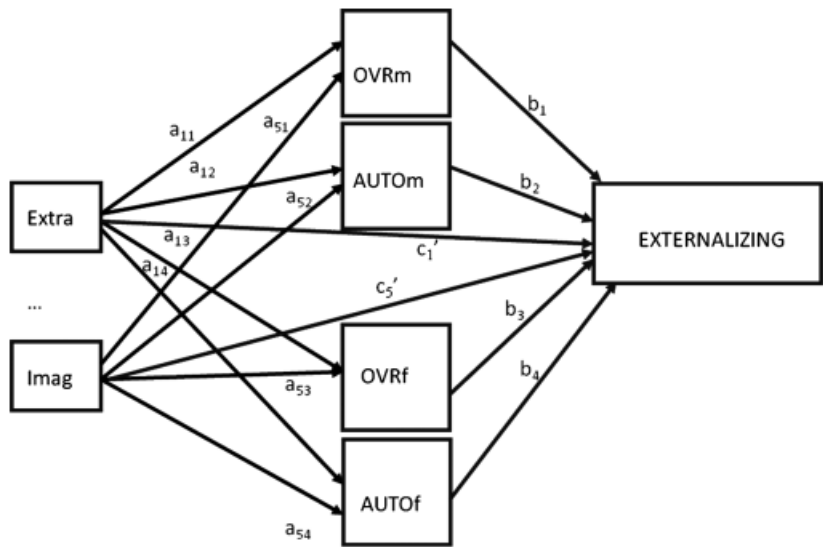


Figure 1

Mediating effects of parenting on relation between child personality and externalizing behavior. Extra = Extraversion; Imag = Imagination; OVR = overreactivity; AUTO = authoritative parenting; f = father; m = mother.

effect of the *M* on the DV, partialling out the effect of the IV. More specifically, an indirect effect is the multiplication of the unstandardized regression weight of the IV on the M and the weight of the M on the DV. In the case of multiple mediators (see Figure 1), it is possible to estimate total indirect effects (i.e., sum of all $a \times b$ weights) as well as specific indirect effects (e.g., effects for each individual mediator). Multiple mediation analysis allows a determination of the total indirect effect with the aim of determining whether an overall effect exists. In addition, it is possible to determine to what extent specific mediators mediate the $X \rightarrow Y$ effect, conditional on the presence of other mediators in the model, and it allows an evaluation of the relative magnitudes of the specific indirect effects associated with all mediators (Preacher & Hayes, 2008). Additionally, the mediational analyses allow for the statistical control of specified covariates. In all analyses, child age was included as a covariate.

The current study employed a bootstrapping method (with $n = 5,000$ bootstrap resamples) to assess the indirect effects (see Preacher & Hayes, 2008). Bootstrapping is a nonparametric resampling procedure that is advocated for testing indirect effects in multiple mediation models. The

bootstrapping method generates an empirical approximation of the sampling distribution of a statistic from the available data and does not impose the assumption of normality or symmetry of the sampling distribution. More specifically, the bootstrapping sampling distributions of the indirect effects are empirically generated by taking a sample (with replacement) of size n from the full data set and calculating the indirect effects in the resamples. This way, point estimates and 95% confidence intervals are estimated for the indirect effects. As a stringent test of our hypotheses, we considered point estimates of indirect effects significant in case zero was not contained in the confidence interval. Further, as we examined multiple parenting dimensions, specific indirect effects are reported, which allow for a direct comparison.

To test whether child gender moderated the mediation effects, a multiple group analysis was performed. First, a multigroup baseline model was established against which subsequent models that include equality constraints were compared. This model was used as the yardstick against which to determine the tenability of the imposed equality constraints. In a next step, cross-group equality constraints were placed across the data of boys and girls on the relations between personality, parenting, and externalizing behavior.

RESULTS

Descriptive Statistics and Correlation Analyses

The means, medians, and standard deviations for the whole sample and for boys and girls separately are presented in Table 1. All variables were approximately normally distributed (skewness range: $-.70$ to $.79$; kurtosis range: -1.23 to 0.88). Independent samples of t tests revealed that teachers rated girls as more benevolent and conscientious than boys. Mother and father ratings of overreactivity were higher for boys than for girls. Mothers reported more authoritative parenting in mother–son interactions than in mother–daughter interactions. There was no gender difference with respect to self-reported externalizing behavior.

Intercorrelations between the variables and Cronbach's alphas are presented in Table 2. The intercorrelations indicate that Benevolence and Conscientiousness were negatively and Extraversion was positively related to externalizing behavior. Maternal and paternal overreactive parenting was positively related to children's externalizing behavior. Only paternal authoritative parenting was negatively related to children's externalizing behavior. The small to moderate

Table 1
Mean Scores, Standard Deviations, Median, Skewness, and Kurtosis of the Predictor and Criterion Variables
(*N* = 434)

	Total sample (<i>N</i> = 434)				Boys (<i>n</i> = 209)		Girls (<i>n</i> = 225)		<i>t</i>
	Mean	<i>SD</i>	Median	Skewness	Kurtosis	Mean	<i>SD</i>	Mean	<i>SD</i>
1. Age	130.23	12.84	132.00	− 0.02	− 1.23	130.6	12.8	129.9	12.9
2. SES	5.03	1.92	5.00	0.38	− 0.66	5.03	2.02	5.02	1.84
3. Extraversion	3.13	0.61	3.19	− 0.34	0.21	3.11	0.61	3.14	0.60
4. Benevolence	3.71	0.57	3.75	− 0.70	0.42	3.63	0.58	3.79	0.56
5. Conscientiousness	3.61	0.68	3.69	− 0.41	− 0.34	3.45	0.70	3.76	0.63
6. Emotional stability	3.55	0.65	3.63	− 0.56	0.18	3.58	0.66	3.52	0.65
7. Imagination	3.44	0.66	3.47	− 0.09	− 0.52	3.44	0.67	3.43	0.66
8. Overreactivity M	3.13	0.83	3.11	0.09	− 0.02	3.23	0.81	3.03	0.83
9. Authoritative M	3.92	0.42	3.91	− .10	0.88	3.87	0.43	3.96	0.41
10. Overreactivity F	3.16	0.79	3.11	.21	0.35	3.25	0.81	3.08	0.76
11. Authoritative F	3.61	0.51	3.66	− 0.35	0.54	3.58	0.52	3.64	0.50
12. Externalizing	10.30	5.47	9.67	0.79	0.80	10.30	5.48	10.31	5.46

Note. Age = Age in months at T1; SES = Socioeconomic status; M = Mother; F = Father.

p* < .05. *p* < .01. ****p* < .001.

Table 2
Pearson Correlations and Cronbach's Alphas of the Predictor and Criterion Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	—	.05	-.01	-.13	-.13	-.08	-.09	.02	.14*	.04	-.12	.20**
2. SES	.04	—	-.11	.02	.06	.03	-.07	-.03	-.06	-.10	-.09	-.07
3. Extraversion	-.08	-.04	(.94)	-.07	.08	.45***	.49***	-.03	-.01	-.11	.05	.20**
4. Benevolence	-.06	.02	-.07	(.95)	.32***	.04	-.02	-.09	-.00	-.12	.00	-.29***
5. Conscientiousness	.03	.02	.15*	.33***	(.96)	.23***	.62***	-.05	.03	-.10	.09	-.15*
6. Emotional stability	.03	-.01	.51***	.09	.21**	(.90)	.46***	.05	-.08	-.14*	-.01	.12
7. Imagination	.02	.11	.56***	.09	.59***	.48***	(.94)	.00	-.00	-.08	.08	.08
8. Overreactivity M	.03	.00	.02	-.13	-.03	.06	-.06	(.77)	.29***	.21**	-.15*	.14*
9. Authoritative M	.01	.02	.03	.12	.05	.03	.13	-.33***	(.91)	.01	.41***	.07
10. Overreactivity F	.03	.05	.10	-.16*	-.00	-.01	-.01	.26***	-.14	(.75)	-.12	.19**
11. Authoritative F	.07	-.09	.07	.09	.11	.12	.04	-.16*	.38***	-.32***	(.93)	-.14*
12. Externalizing	-.05	.05	.16*	-.27***	-.18**	.05	-.02	.22**	-.17	.18*	-.26***	(.83)

Note. Age = Age in months at T1; SES = Socioeconomic status; M = Mother; F = Father. Correlations for boys ($n = 209$) are presented below the diagonal, and correlations for girls ($n = 225$) above the diagonal. Alphas for the whole sample are presented on the diagonal in parentheses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

correlations between maternal and paternal parenting ratings were considered low enough to justify the simultaneous inclusion of these variables ($r_s \leq .41$). SES was not related to any of the variables and was not included in further analyses. All measures showed adequate to good internal consistency (see Table 2).

A more stringent test of the relative impact of each of the personality dimensions on parenting and externalizing behavior is, however, provided by a path model, in which the contributions of all personality and parenting dimensions are taken into account simultaneously.

Mediating Effects of Maternal and Paternal Parenting in the Relation Between Child Personality and Externalizing Behavior

The results of the multiple mediation analysis are presented in Table 3. Fit indices of the model in which the effects of child personality characteristics on externalizing behavior were mediated by paternal and maternal parenting indicated a good fit $\chi^2(6, N = 434) = 3.58$, $p = .73$. The CFI was 1.00, the RMSEA was .0 (CI: 0–0.05), and the SRMR was .014. Multiple mediation analysis revealed that Extraversion was positively and Benevolence was negatively associated with externalizing behavior 3 years later (c weights). Only Benevolence was also negatively associated with paternal and maternal overreactivity (a weights). Conscientiousness was positively related to paternal authoritative parenting. With respect to the effects of parenting on externalizing behavior (b weights), analyses showed that maternal overreactivity was positively and paternal authoritative parenting was negatively associated with externalizing behavior. Most important, and as can be seen in Table 3 (indirect effects $a \times b$), paternal and maternal overreactivity partially mediated the relation between Benevolence and externalizing behavior. The effect of Benevolence on externalizing behavior was reduced with 12% by the inclusion of overreactive parenting. Further, father's authoritative parenting partially mediated the relation between Conscientiousness and externalizing behavior (reduction of 23%). Mother's overreactive parenting partially mediated the relation between Emotional Stability and externalizing behavior (reduction of 25%). This model explained 18% of the variance in externalizing behavior.

The contrast testing effect of the mediating effect of overreactive and authoritative parenting revealed that overreactivity mediated the relation between Benevolence/Emotional Stability and externalizing

Table 3

Total, Direct, and Indirect Effects of Personality on Externalizing Behavior (Dependent Variable) Through Parenting

	Independent Variable (IV)	Mediating Variable (M)	Effect of IV on M (<i>a</i>)	Effect of M on DV (<i>b</i>)	Direct Effects (<i>c'</i>)	Indirect Effect (<i>a</i> × <i>b</i>)	Total Effects (<i>c'</i>)
1.	Extraversion	Overreactivity _m	-.06	0.78*	1.62**	-.05 [-.26 -.07]	1.48**
		Authoritative _m	.01	1.16		.01 [-.08 -.17]	—
		Overreactivity _f	.03	0.60		.02 [-.07 -.17]	—
		Authoritative _f	.06	-2.02***		-.12 [-.42 -.08]	—
2.	Benevolence	Overreactivity _m	-.18*	0.78*	-1.95***	-.14 [-.37 -.02]	-2.16***
		Authoritative _m	.06	1.16		.07 [-.01 -.29]	—
		Overreactivity _f	-.20**	0.60		-.12 [-.33 -.01]	—
		Authoritative _f	.01	-2.02***		-.02 [-.25 -.18]	—
3.	Conscientiousness	Overreactivity _m	-.02	0.78*	-.64	-.01 [-.17 -.13]	—
		Authoritative _m	.01	1.16		.01 [-.09 -.16]	—
		Overreactivity _f	-.00	0.60		-.00 [-.12 -.10]	—
		Authoritative _f	.09*	-2.02***		-.19 [-.48 -.02]	—
4.	Emo. Stability	Overreactivity _m	.14	0.78*	.43	.11 [.01 -.31]	.40
		Authoritative _m	-.05	1.16		-.06 [-.23 -.01]	—
		Overreactivity _f	-.07	0.60		-.04 [-.21 -.02]	—
		Authoritative _f	.02	-2.02***		-.04 [-.24 -.13]	—
5.	Imagination	Overreactivity _m	-.05	0.78*	-.18	-.04 [-.27 -.09]	-.08
		Authoritative _m	.05	1.16		.06 [-.03 -.28]	—
		Overreactivity _f	-.02	0.60		-.01 [-.17 -.08]	—
		Authoritative _f	-.05	-2.02***		.10 [-.12 -.38]	—

Note. Results based on 5,000 bootstrap samples. Bias-corrected 95% confidence interval reported in brackets. Indirect effects that are statistically significant are in bold.

m: = mother ratings, f = father ratings.

p* < .05. *p* < .01. ****p* < .001.

behavior significantly more than authoritative parenting for mothers, but not for fathers. In addition, overreactivity of mothers was a stronger mediator for the relation between Emotional Stability and externalizing behavior than overreactivity of fathers. The mediation effect of overreactivity for the relation between Benevolence and externalizing behavior was not statistically different for mothers and fathers.

To test whether the effects for boys and girls were similar, a multigroup analysis was performed. First, a multigroup baseline model was established against which subsequent models that include equality constraints were compared. In this model, specifications describing the multiple mediation model were similarly specified for boys and girls. The CFI value of 1.00, the RMSEA of 0 (CI: 0–0.6), and the $\chi^2_{(13)} = 11.67$, $p = .55$ indicated an adequate fit to the data representing both boys and girls. This model was used as the yardstick against which to determine the tenability of the imposed equality constraints. The goodness-of-fit statistics of this model indicated a very acceptable fit. The CFI value was 1.00, the RMSEA was 0 (CI: 0–0.05), and the $\chi^2_{(42)} = 41.98$, $p = .47$. A comparison with the baseline model yielded a $\Delta\chi^2_{(29)} = 30.3$, which is statistically nonsignificant ($p = .40$). This indicated that the relations between personality, parenting, and externalizing behavior were not moderated by child gender.

DISCUSSION

Direct Effects of Child's Personality

Results of this study indicate that child personality is directly related to externalizing behaviors. Consistent with previous cross-sectional research (e.g., John et al., 1994; Lynam et al., 2005), in this study it was found that Benevolence was negatively and Extraversion was positively related to externalizing behavior 3 years later. These relations indicate that children who were rated by teachers as low on Benevolence and high on Extraversion reported higher levels of externalizing behavior 3 years later. Several mechanisms may account for the associations between personality and adjustment problems. For example, specific personality dimensions may operate as a diathesis, predisposing an individual to develop adjustment problems under specific conditions. Personality characteristics may also shape an individual's environment or experiences by biasing information processing (Rothbart & Bates,

1998). Children who are benevolent tend to exhibit traits that evoke positive relationships with peers and adults. The link between Extraversion and externalizing behavior may primarily be the result of elevated activity levels. In personality models, activity is usually included as a lower-order facet of Extraversion. Higher activity not only is a key characteristic of children with hyperactivity, but it also characterizes children with disruptive behavior (Nigg, 2006). In addition, several studies suggest that children with high scores on Extraversion are at higher risk for externalizing behavior because they are less inhibited (Tackett, 2006). In contrast with our hypotheses, the direct effect of Conscientiousness on externalizing behavior was not statistically significant in the multivariate analyses, although the bivariate correlation was significant. However, the indirect effect through paternal authoritative parenting was statistically significant.

Direct Effects of Parenting

Results showed that children whose fathers use more authoritative parenting exhibit lower levels of externalizing behavior 3 years later. This result suggests that paternal authoritative parenting may positively influence adolescent adjustment. Several studies provided empirical evidence of the beneficial effects of authoritative parenting (for a review, see Steinberg, 2001). Authoritative parenting promotes children's empathy and psychological autonomy, which in turn reduce externalizing behavior (Zhou et al., 2008).

Children whose mothers display overreactive parenting report higher levels of externalizing behavior. That maternal overreactivity is related to later externalizing behavior is in accordance with previous findings (Patterson et al., 1992). Several intervention studies show that altering harsh parental behavior can produce meaningful changes in children's adjustment (O'Connor, 2002). The positive relations between overreactive parenting and children's externalizing behavior can be explained by the Social Learning Theory (Bandura, 1978). According to this theory, parents who use overreactive parenting expose children to a model of aggressive behavior that children imitate. Overreactive parenting consists of, for example, overt expressions of anger and arguing. Results confirm that paternal and maternal parenting contribute uniquely to the development of children.

Mediating Effects of Parenting

In this study, it was found that less benevolent children were exposed to elevated levels of overreactive parenting, and through this showed higher levels of externalizing behavior 3 years later, a finding that is in accordance with previous research (see, e.g., Manders et al., 2006). One possible explanation for this finding concerns child effects on parenting behaviors. Children who are agreeable and empathic, good humored and cheerful may be more inclined to maintain positive relations with their parents and are thus more likely to obey their parents, which may evoke a positive, favorable rearing climate.

In addition, children who were rated by their teacher as more conscientious had fathers who reported higher levels of authoritative parenting, which in turn was related to lower levels of externalizing behavior. Fathers may feel their authoritative parenting is more effective with their conscientious children, who are reliable, are planful, and have high levels of achievement motivation. Similarly, Asendorpf and van Aken (2003) found that adolescents with higher levels of Conscientiousness reported increasing levels of support from their fathers (but not from their mothers) between the ages of 12 and 17 years. As a possible explanation, they suggested that fathers may value Conscientiousness in their children because of its importance for school achievement.

Finally, maternal overreactivity mediated the relation between Emotional Stability and externalizing behavior. Emotional Stability consists of lower levels of anxiety and fear. It is possible that children with lower levels of anxiety are less sensitive to punishment (Nigg, 2006). Over time, difficulties in learning from punishment may lead to overreactive parenting and coercive cycles between mother and child, and subsequently to externalizing behavior (Patterson et al., 1992).

Moderating Effect of Child Gender

Studies of gender differences for externalizing behaviors have reported conflicting results. Some studies reported that boys scored higher than girls on both aggressive and delinquent behaviors (e.g., Stanger, Achenbach, & Verhulst, 1997), whereas other studies concluded that gender differences were negligible at ages 15–16 (e.g., Achenbach et al., 2008). Similarly, boys show initially higher rates of oppositional defiant disorder (ODD), but in adolescence this difference seems to disappear (Boylan, Vaillancourt, Boyle, & Szatmari, 2007). Results of

this study reveal that relations between personality, parenting, and externalizing behavior were not moderated by child gender.

Limitations and Future Research

Although this study extends previous research in several ways, some limitations are also worth noting. First, although this longitudinal study shows a clear association between child personality and adverse parenting on children's externalizing behavior, it does not imply that conclusions can be drawn about reciprocal and recurrent interactions over time between the child and the environment, as postulated by transactional models (Lytton, 1990). Child personality (predictor) and parenting (mediator) were measured at the same time. From this study, it is not clear whether overreactive parenting was a reaction to the child's behavior or vice versa. Future research should focus on the extent to which changes in externalizing behavior over time can be explained by (changes in) personality and parenting. Furthermore, parents and children were biologically related. This means that the parenting effects and child outcomes probably not only reflect environmental influences but also genetic influences (see Rowe, 1990). Finally, due to sample size, only questionnaires were used to measure the dependent and independent variables. Future research will need the inclusion of different methods (e.g., observations).

Taken together, this study is of theoretical interest because the results demonstrate that parenting is a mediating mechanism that accounts for associations between personality and externalizing behavior. The reported relations between personality, parenting, and externalizing behavior illustrate the complex mechanisms by which personality and the environment interact and shape adjustment problems later on.

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